

TECHNICAL SUPPORT DOCUMENT (TSD)

1.0 INTRODUCTION

The SFPP, LP Phoenix Terminal is a fuel storage and distribution facility owned and operated by SFPP, LP, located at 49 North 53rd Avenue, Phoenix, AZ. SFPP, LP Phoenix Terminal as a categorical source is a major source for two criteria pollutants, CO and VOC emissions, but not for Hazardous Air Pollutants (HAP).

The Phoenix metropolitan area has been designated as serious nonattainment for PM₁₀ National Ambient Air Quality Standards and as marginal nonattainment for the 8 hour Ozone National Ambient Air Quality Standard.

This Technical Support Document (TSD) is intended to provide additional information associated with the technical and regulatory evaluation of the application for the issuance of this revision of Permit V95002. This TSD is not a part of the Permit and is not legally enforceable.

2.0 FACILITY DESCRIPTION

SFPP, LP Phoenix Terminal as a fuel storage and distribution facility receives various fuels primarily by pipeline but also by truck and rail and has a storage capacity of greater than 300,000 barrels thus making it a categorical source. In the course of its operations it produces a variety of fuel blends and via an array of loading racks distributes the fuels to tank trucks for delivery to various area customers. In the loading of tank trucks vapor recovery systems are used to reduce the emissions of VOC to the atmosphere.

3.0 DESCRIPTION OF APPLICATION 407582 FOR SIGNIFICANT REVISION 1.4.0.0 OF THIS PERMIT

SFPP, LP Phoenix Terminal has applied for a significant revision to its Title V Permit V95002 to provide for the vapor generated during the tank truck loading at loading racks LR-9, LR-10 and LR-11 to be directed to its John Zink Thermal Oxidizer, Model # ZCT-2-3-11-50-X-2/8-3/8, Vapor Combustion Unit rather than to its existing Carbon Adsorption Units (CAU-2 and CAU-3). The vapor from loading racks LR-9 & LR-10 is currently treated in CAU-2 as primary with CAU-3 as backup and LR-11 vapor is currently treated in CAU-3 as primary with CAU-2 as a backup.

When LR-9, LR-10 and LR-11 are connected to the John Zink Thermal Oxidizer, CAU-2 and CAU-3 will be taken out of service and there will be an increase in combustion emissions.

This analysis is based on a maximum annual limit on combined throughput of 1,301,000,000 gallons for loading racks LR-9, LR-10 and LR-11. This throughput represents the combined total throughput from the former Chevron and Conoco Phillips assets incorporated into the SFPP terminal. The former Chevron assets contribute 430,000,000 gallons/year and the Conoco Phillips assets contribute 871,000,000 gallons/year to this total. (See TSD Permit Revision 0.3.0.0, June 28, 2011).

While a combination of petroleum products (i.e., diesel, gasoline, transmix, jet fuel), may be loaded through these loading racks, emissions are based on the assumption that all throughput is gasoline loading. Table 1 presents the emissions increases associated with the modification along with the significance level limits in Rule 100.

Table 1 – Increase in Emissions Compared with Significance Level

| Pollutant | Increase, TPY | Significance Level, TPY |
|--------------------|---------------|-------------------------|
| Carbon Monoxide | 59.63 | 100 |
| Nitrogen Oxides | 10.96 | 40 |
| Sulfur Dioxide | 0.02 | 40 |
| Particulate Matter | 1.20 | 25 |
| PM ₁₀ | 1.20 | 15 |
| VOC | 0.00 | 40 |

VOC potential to emit (PTE) will not increase over the present allowable limit since all loading rack control equipment is required to meet the standard of 0.08 lbs VOC/1000 gallons of product loaded and reduce the VOC in the vapor by a minimum of 95% in accordance with Permit Conditions 18.b.i.1 and 18.i.2. Neither

will there be an increase in hazardous air pollutants as the HAP are a function of the VOC emissions. The speciation profile of the VOC emissions is not expected to change materially as a result of this modification.

Emissions from tanker truck loading may be estimated using the following equation from AP-42, Chapter 5 Section 2:

$$L = 12.46(S)(V)(M)/(T)$$

Where:

L = Loading Loss in lbs VOC/1000gallons of product loaded

S= Saturation Factor = 1 from Table 5.2-1

V = True Vapor Pressure of gasoline at loading conditions (8.24 psia)

M = Vapor Molecular weight at loading conditions (66 lbs/lb-mole

T = Temperature in degrees Rankin at loading conditions = 535.5°R

The data used in the emissions calculations have been selected to be consistent with the TSD for Permit Revision 0.3.0.0 dated June 28, 2011. The true vapor pressure is conservative in that it is based on a high temperature and assumes all loading is gasoline. Actual loading temperatures are expected to be lower over the course of a year as the annual average ambient temperature in Phoenix is 85.1°F (545.1°R). In addition, the bulk liquid temperature of the loaded product is typically significantly lower than ambient temperatures.

The results of this calculation indicate that 12.24 lbs VOC/1000 gallons of product loaded are emitted during truck loading. However, due to truck tightness and vapor system losses, only 99.2% of the generated vapor enter the thermal oxidizer. Multiplying 12.24 by 99.2% results in the corrected flow to the oxidizer of 12.14 lbs VOC/1000 gallons of product loaded.

The total pounds of vapor entering the oxidizer annually are calculated by multiplying the annual throughput of 1,301,000,000 gallons of product loaded by 12.14 lbs VOC/1000 gallons of product loaded resulting in annual vapor load of 15,800,125 lbs VOC.

To calculate a corresponding MMBTU value with this quantity of vapor, the LHV of natural gas was multiplied by the lbs of VOC in the paragraph above. The LHV of natural gas is approximately 20,267 Btu/lb, however, 20,400 Btu/lb was used to be consistent with the calculations in the TSD Permit Revision 0.3.0.0. This multiplication results in an MMBTU value of 322,323 annually. The combustion pollutant emissions are calculated using AP-42 factors consistent with prior calculations of combustion pollutants at the Phoenix Terminal. The incremental increases for thermal oxidizer combustion pollutants are calculated by multiplying the specific emission factor times 322,323 MMBTU. The results are shown on Table 2.

Table 2 – Incremental Increase in PTE of Combustion Pollutants.

| Pollutant | Emission Factor, lbs/MMBTU | Emissions, TPY |
|--------------------|----------------------------|----------------|
| Particulate Matter | 0.00745 ¹ | 1.20 |
| Nitrogen Oxides | 0.068 ² | 10.96 |
| Sulfur Dioxide | 0.00009 ³ | 0.02 |
| Carbon Monoxide | 0.37 ⁴ | 59.63 |

¹ AP-42 Table 1.4-2 “Emission Factors for Criteria Pollutants and Greenhouse Gases from Natural Gas Combustion”

² Derived from AP-42 Table 13.5-1 “Emission Factors for Flare Operations” as presented in TSD Permit Revision 0.3.0.0.

³ Based on gasoline sulfur content of 90 ppm

⁴ Derived from AP-42 Table 13.5-1 “Emission Factors for Flare Operations” as presented in TSD Permit Revision 0.3.0.0

Table 3 which follows provides the necessary changes to the facility-wide emission limits based on the above calculated values. As before, monthly limits are approximately equal to ten percent of annual limits.

Table 3 – Changes to Facility-Wide Emissions

| Pollutant | Monthly Emissions Limits, Tons | | Twelve Month Rolling Emission Limits, Tons | |
|---|-----------------------------------|-----------|---|-----------|
| | Current | Proposed | Current | Proposed |
| VOC | 46 | No Change | 462 | No Change |
| NO _x | 2.4 | 3.5 | 24 | 35 |
| CO | 12 | 18.1 | 121 | 181 |
| PM ₁₀ | 0.25 | 0.37 | 2.5 | 3.7 |
| PM _{2.5} | 0.25 | 0.37 | 2.5 | 3.7 |
| Total Hazardous Air Pollutants | 2.4 | No Change | 24 | No Change |
| Single Hazardous Air Pollutant | 0.8 | No Change | 7.8 | No Change |

SFPP understands that there will be fugitive component emissions associated with the modification as new connections are made. These fugitive component emissions will be offset by reductions in fugitive component emissions associated with CAU-2 and CAU-3. SFPP plans to decommission the carbon adsorption units and remove them from the site as soon as practical. Since emissions from components already included in the permit assume 24/7 operation, removal of CAU-2 and CAU-3 will assure that fugitive component emissions will not be materially greater than under current operation.

The potential greenhouse gas (GHG) emissions have previously been addressed by SFPP and anticipated combustion of all loading rack vapors, including loading racks LR-9 through LR-11. The GHG emissions are included in Appendix B of TSD 0.3.0.0 Revision 1, a copy of which is included on the following page. Significance for GHG increases is based on language in 40 CFR 52.21(b)(49) which defines a significant increase as an increase greater than 75,000 tons annually. GHG emissions from all sources at the Phoenix Terminal are less than 75,000 tons annually.

The remainder of this page is intentionally left blank to accommodate the display of GHG emissions mentioned in the paragraph above.

GHG Emissions from Appendix B of TSD 0.3.0.0, Revision 1.

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$$L = 12.46 \times \frac{SPM}{T}$$

Where:

L = loading loss (lbs/1000 gallons)

S = saturation Factor (based on AP-42, Table 5.2-1)

P = TVP of liquid loaded

M = molecular weight of vapors (lb/lb-mole)

T = temperature of bulk liquid loaded (R)

Assumption:

S = 1, P = 6.6 psia, T = 553.5 R, M = 66 lb/lb-mole.

$$L = 12.46 \times \frac{1 \times 8.24 \times 66}{553.5} = 12.243 \frac{\text{lb}}{1000 \text{ gal}}$$

LOADING-PTE

| Source | Commodity | Monthly Throughput, 1000 gal | Annual Throughput, 1000 gal | Loading Losses (lbs/1000 gallons) | Monthly Loading Emissions (lb/month) | Annual Loading Emissions (lb/year) |
|--|-----------|------------------------------|-----------------------------|-----------------------------------|--------------------------------------|------------------------------------|
| Existing KM, excluding Chevron Assets (based on Title V permit condition 18 (A) (2)) | Gasoline | 300,000.00 | 2,914,000.00 | 12.24 | 3,672,900.00 | 35,676,102.00 |
| Chevron Assets (based on maximum allowable throughput from permit 960967) | Gasoline | 43,000.00 | 430,000.00 | 12.24 | 526,320.00 | 5,263,200.00 |
| Total Loading Emissions | | | | | 4,199,220.00 | 40,939,302.00 |

| Source | Annual Loading Emissions (lb/year) | Carbon Content | CO2 (lbs/year) | CO2 (MT/year) |
|-------------------------|------------------------------------|----------------|----------------|---------------|
| Total Loading Emissions | 40,939,302.00 | 85.5% | 128,266,991.86 | 58,181.00 |

GHG Emissions - Combustion of Supplemental Fuel

| Source | VOC emissions (tons/year) | VOC emissions (lbs/year) (A) | Fuel (MMscf/year) |
|---|---------------------------|------------------------------|-------------------|
| 15 HP emergency generator - limited to 500 hours of operation (natural gas/propane) | 0.07 | 135.00 | 24.55 |

(A) VOC emissions calculated based on AP-42, Table 1-4.2 combustion factors for natural gas.

15 HP Emergency Generator

| | | |
|-------------------|----------|--------------|
| Annual Fuel Usage | 24.55 | MMscf/year |
| CO2 EF | 53.02 | kg CO2/MMBtu |
| CH4 EF | 0.001 | kg CH4/MMBtu |
| N2O EF | 0.0001 | kg N2O/MMBtu |
| HHV | 1028 | MMBtu/MMscf |
| CO2 Emissions | 1,337.84 | MT CO2 |
| CH4 Emissions | 0.03 | MT CH4 |
| N2O Emissions | 0.003 | MT N2O |
| CO2e emissions | 1,339.15 | MT CO2e |

Facility-wide Greenhouse Gas Emissions

| Source Type | CO2e (MT/year) |
|---------------------|----------------|
| Loading Emissions | 58,181.00 |
| Generator Emissions | 1,339.15 |
| Total | 59,520.15 |

The source has pointed out that, while this application is being processed as a significant revision in agreement with Maricopa County so that public participation and EPA review are included in the processing of the application, otherwise the proposed modification complies with the requirements for a minor modification as identified in Rule 210 Section 405.1.